otospondylomegaepiphyseal dysplasia

Otospondylomegaepiphyseal dysplasia (OSMED) is a condition characterized by skeletal abnormalities, distinctive facial features, and severe hearing loss. The term "otospondylomegaepiphyseal" refers to the parts of the body that this condition affects: the ears (oto-), the bones of the spine (spondylo-), and the ends (epiphyses) of long bones in the arms and legs. The features of this condition significantly overlap those of two similar conditions, Weissenbacher-Zweymüller syndrome and Stickler syndrome type III. All of these conditions are caused by mutations in the same gene, and in some cases, it can be difficult to tell the conditions apart. Some researchers believe they represent a single disorder with a range of signs and symptoms.

People with OSMED are often shorter than average because the long bones in their legs are unusually short. Other skeletal features include enlarged joints; short arms, hands, and fingers; and flattened bones of the spine (platyspondyly). People with the disorder often experience back and joint pain, limited joint movement, and arthritis that begins early in life.

Severe high-frequency hearing loss is common in people with OSMED. Typical facial features include protruding eyes; a flattened bridge of the nose; an upturned nose with a large, rounded tip; and a small lower jaw. Almost all affected infants are born with an opening in the roof of the mouth (a cleft palate).

Frequency

This condition is rare; its prevalence is unknown. Only a few families with OSMED worldwide have been described in the medical literature.

Genetic Changes

OSMED is caused by mutations in the *COL11A2* gene. This gene provides instructions for making one component of type XI collagen, which is a complex molecule that gives structure and strength to the connective tissues that support the body's joints and organs. Type XI collagen is found in cartilage, a tough but flexible tissue that makes up much of the skeleton during early development. Most cartilage is later converted to bone, except for the cartilage that continues to cover and protect the ends of bones and is present in the nose and external ears. Type XI collagen is also part of the inner ear and the nucleus pulposus, which is the center portion of the discs between vertebrae.

The *COL11A2* gene mutations that cause OSMED disrupt the production or assembly of type XI collagen molecules. The defective collagen weakens connective tissues in many parts of the body, including the long bones, spine, and inner ears, which impairs bone development and underlies the other signs and symptoms of this condition.

Inheritance Pattern

This condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- chondrodystrophy with sensorineural deafness
- Insley-Astley syndrome
- mega-epiphyseal dwarfism
- Nance-Insley syndrome
- Nance-Sweeney chondrodysplasia
- OSMED
- oto-spondylo-megaepiphyseal dysplasia

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Otospondylomegaepiphyseal dysplasia
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0432210/

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Health Topic: Bone Diseases
  https://medlineplus.gov/bonediseases.html
- Health Topic: Connective Tissue Disorders
  https://medlineplus.gov/connectivetissuedisorders.html
- Health Topic: Hearing Disorders and Deafness
  https://medlineplus.gov/hearingdisordersanddeafness.html

Genetic and Rare Diseases Information Center

- OSMED Syndrome
  https://rarediseases.info.nih.gov/diseases/4130/osmed-syndrome

Additional NIH Resources

- National Institute of Arthritis and Musculoskeletal and Skin Diseases: Questions and Answers about Heritable Disorders of Connective Tissue
  https://www.niams.nih.gov/Health_Info/Connective_Tissue/

Educational Resources

- Disease InfoSearch: OSMED Syndrome
  http://www.diseaseinfosearch.org/OSMED+Syndrome/5438
- MalaCards: otospondylomegaepiphyseal dysplasia
  http://www.malacards.org/card/otospondylomegaepiphyseal_dysplasia
- Nemours Children's Health System: Skeletal Dysplasia
  https://www.nemours.org/service/medical/skeletal-dysplasia.html?tab=about
- Orphanet: Otospondylomegaepiphyseal dysplasia
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=1427

Patient Support and Advocacy Resources

- Cleft Palate Foundation
  http://www.cleftline.org/
- Human Growth Foundation
  http://hgfound.org/
- International Skeletal Dysplasia Registry, UCLA
  http://ortho.ucla.edu/isdr
- Little People of America
  http://www.lpaonline.org

- My Baby's Hearing, Boys Town National Research Hospital
  https://www.babyhearing.org/
- National Organization for Rare Disorders (NORD)
  https://rarediseases.org/rare-diseases/osmed-homozygous/
- Resource List from the University of Kansas Medical Center
  http://www.kumc.edu/gec/support/connect.html

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28otospondylomegaepiphyseal+dysplasia%5BTIAB%5D%29+OR+%28oto-spondylo-megaepiphyseal+dysplasia%5BTIAB%5D%29%29+OR+%28%28OSMED%5BTIAB%5D%29+AND+%28collagen*%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D

OMIM

- OTOSPONDYLOMEGAEPIPHYSEAL DYSPLASIA
  http://omim.org/entry/215150

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